ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8807260164 DOC.DATE: 88/07/15 NOTARIZED: NO DOCKET #
FACIL:50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylva 05000388
AUTH.NAME AUTHOR AFFILIATION
WEHRY,R.R. Pennsylvania Power & Light Co.
BYRAM,R.G. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: LER 88-010-00:on 880305,delaminating foil on insulation in primary containment.

W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 4
TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:LPDR 2 cys Transcripts. 05000388

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD1-2 LA	1	1	PD1-2 PD	1	1
	THADANI,M	1	1			
INTERNAL:	ACRS MICHELSON	1	1	ACRS MOELLER	2	2
	AEOD/DOA	1	1	AEOD/DSP/NAS	1	1
	AEOD/DSP/ROAB	2	2	AEOD/DSP/TPAB	1	1
	ARM/DCTS/DAB	1	1	DEDRO	1	1
	NRR/DEST/ADS 7E	1	0	NRR/DEST/CEB 8H	1	1
	NRR/DEST/ESB 8D	1	1	NRR/DEST/ICSB 7	1	1
	NRR/DEST/MEB 9H	1	1	NRR/DEST/MTB 9H	1	1
	NRR/DEST/PSB 8D	1	1	NRR/DEST/RSB 8E	1	1
	NRR/DEST/SGB 8D	1	1	NRR/DLPQ/HFB 10	1	1
	NRR/DLPQ/QAB 10	1	1	NRR/DOEA/EAB 11	1	1
	NRR/DREP/RAB 10	1	1	NRR/DREP/RPB 10	2	2
	NRR/DRIS/SIB 9A	1	1	NUDOCS-ABSTRACT	1	1
	REG FILE 02	1	1	RES TELFORD,J	1	1
	RES/DSIR DEPY	1	1	RES/DSIR/EIB	1	1
	RGN1 FILE 01	1	1			
EXTERNAL:	EG&G WILLIAMS,S	4	4	FORD BLDG HOY,A	1	1
	H ST LOBBY WARD	1	1	LPDR	2	2
	NRC PDR	1	1	NSIC HARRIS,J	1	1
	NSIC MAYS,G	1	1			
NOTES:		2	2			

TOTAL NUMBER OF COPIES REQUIRED: LTTR 48 ENCL 47

RIDS/ADDS RIDS/ADDS

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Susquehanna Steam Electric Station - Unit 2	0 5 0 0 0 3 8 8	1 OF 0 3

TITLE (4)

Delaminating Foil on Insulation in Primary Containment

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 3	0 5	8 8	8 8	0 1 0	0 0	0 7	1 5	8 8		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Richard R. Wehry - Power Production Engineer - Compliance	7 1 1 7 5 4 2 - 3 6 6 4

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

This LER provides information concerning a condition involving Temp-Mat fibrous insulation blankets covered with aluminum laminated Alpha Maritex Style #2025/9480 HT fiberglass cloth which had been used extensively in the primary containment at Susquehanna SES Unit 2. The aluminum foil on the surface of the Alpha Maritex cloth covering the Temp-Mat blankets was found to have delaminated extensively throughout the drywell. This condition was discovered during a walkdown on March 5, 1988 shortly following commencement of a refueling outage. Pursuant to 10CFR21, initial telephone notification to the Commission was provided on March 14, 1988 and a Part 21 Report was submitted on March 21, 1988 per PLA-3003. This condition was limited to SSES Unit 2.

During a Loss-Of-Coolant-Accident, large quantities of loose aluminum foil could have become debris during the blowdown phase. Also, use of drywell spray following a LOCA could have resulted in further debris generation. Insulation debris could be transported to the wetwell during a LOCA, and could have blocked ECCS pump suction strainers, resulting in inadequate NPSH, causing pump damage. Bechtel calculations for the effect of insulation debris on ECCS pump performance had not considered delamination of the aluminum foil as a source of debris.

All subject aluminum laminated Alpha Maritex style fiberglas cloth was removed from the Unit 2 drywell during the refueling outage.

NRC Form 366
(9 83)

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Unit 2 Susquehanna Steam Electric Station	0 5 0 0 0 3 8 8	8 8	— 0 1 0	— 0 0	0 2 OF 0 3

TEXT (If more space is required, use additional NRC Form 366A's) (17)

DESCRIPTION OF EVENT

Following commencement of a refueling outage on Susquehanna SES Unit 2, a walkdown of the primary containment (EIIS Code:NH) was being conducted on March 5, 1988. During this walkdown, the aluminum foil on the surface of Alpha Maritex cloth covering Temp-Mat fibrous insulation blankets was found to have delaminated extensively throughout the drywell.

CAUSE OF EVENT

The Alpha Maritex fiberglas cloth has a rated service temperature of 500 degrees Fahrenheit. However, it has no design humidity or radiation ratings. Normal ambient temperatures in the drywell during operation do not exceed 135 degrees Fahrenheit. However, on March 5, 1988 it was discovered that an apparent breakdown of the laminating adhesive resulted in extensive delamination, resulting in loose or lightly adherent aluminum foil within the Unit 2 drywell. The mechanism for delamination is not known and could be a result of extended exposure to operating temperatures, humidity, radiation or some combination of these or other factors. Based on the apparent extensive breakdown of the laminating adhesive in the Unit 2 drywell, it is expected that continued exposure to operating conditions in containment would have resulted in further delamination of the Alpha Maritex, resulting in free or lightly adherent foil in the Unit 2 drywell.

Although the failure mechanism which caused the delamination is not currently known, due to the widespread nature of its failure, PP&L believes that the root cause is the material (its composition or its fabrication) rather than any local or general phenomena peculiar to the Susquehanna drywell environment.

ANALYSIS OF EVENT

Initial review concluded that the foil delaminating problem warranted a report to the Commission pursuant to 10CFR21, which was submitted on March 21, 1988. However, following further internal review and discussions with the NRC Senior Resident it was concluded that this problem did constitute a reportable condition pursuant to 10CFR50.73(a)(2)(v).

SSES Unit 2 was originally evaluated by Bechtel for the potential for Temp-Mat blanket insulation to block ECCS pump suction strainers in the suppression pool during a Loss-Of-Coolant-Accident. The existing Bechtel analysis considered insulation debris to be generated only in the direct jet zone of a large break LOCA, but did not consider the possibility of free aluminum foil in the drywell. The Bechtel analysis assumed that only insulation destroyed in the direct jet zone could be transported through the downcomers into the wetwell during the initial blowdown.

Free aluminum foil could undergo several mechanisms for transport to the wetwell other than direct jet impingement. Due to the light weight of the free foil, blowdown forces beyond those of the jet zone could transport foil directly to the wetwell through the downcomers. The initial blowdown could also transport foil to the floor of the drywell. Recirculation flow from ECCS systems would flow out of a pipe break, transporting any additional foil in the flow path between the break and the drywell floor. Recirculation flow would flood the drywell floor above the 18" high downcomers, transporting additional foil to the wetwell. Use of drywell sprays could result in further removal of aluminum foil with transport to the drywell floor followed by transport to the wetwell through the downcomers.

Once in the suppression pool, the lightweight, 1 mil thick aluminum foil pieces would not settle rapidly. A substantial fraction could enter the zones of influence of the two core spray and four RHR pump suction strainers, and could be pulled against the strainers.

The strainers are made of perforated plate steel, with 1/8" diameter staggered holes on 3/16" centers. The foil would not be drawn through the stainers. The core spray strainers have a surface area of 18.3 square feet per suction line; the RHR strainers have 43.8 square feet per suction line. Bechtel estimated that there were 5000 square feet of exposed Alpha Maritex initially installed in the Unit 2 drywell. Blockage of the screens by both insulation debris from the pipe break zone and Alpha Maritex aluminum foil debris could have resulted in unacceptable blockage of the screens which would result in inadequate NPSH. This could disable the ECCS pumps.

CORRECTIVE ACTIONS

All subject aluminum laminated Alpha Maritex fiberglass cloth was removed from the Unit 2 drywell during the Unit 2 second refueling outage. This condition was limited to SSES Unit 2.

There were no previous incidents involving the condition identified by this LER.

Pennsylvania Power & Light Company
Two North Ninth Street • Allentown, PA 18101 • 215/770-5151

July 15, 1988

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Susquehanna Steam Electric Station
Licensee Event Report 88-010-00
File R41-2
PLAS- 325

Docket No. 50-388
License No. NPF-22

Attached is Licensee Event Report 88-010-00. This event was determined reportable per 10CFR50.73(a)(2)(v) in that an insulation foil covering on fiberglass insulation material in the primary containment was found to be delaminating. This condition could have resulted in a situation where the safety function of systems needed to: shut down the reactor and maintain it in a safe shutdown condition; remove residual heat; and mitigate the consequences of an accident could have been impaired. A report pursuant to 10CFR21 was submitted to the Commission on March 21, 1988.

R.G. Byrne
Superintendent of Plant - Susquehanna

RRW/mjm

cc: Mr. William Russell
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Frank Young
Sr. Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 52
Shickshinny, PA 18655

IE22
1/1